

**REMARKS**

Applicant has amended claims 1, 2, 4, 5, 7, 11, 12, 13, 15, 17, 21, 60, 67- 70, 72, 74, 76, 77, 79, 81, 83-85, 87, 89, 91, 92, 93, 96, 98, 109, and 114-120 as set forth above. No new matter has been added by way of these amendments. In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

The Office has objected to the drawings asserting that the label "FIG. 5" is missing from FIG. 5. Applicant respectfully traverses this objection and directs the Office's attention to the bottom center of originally filed FIG. 5 which includes the label "FIG. 5" and also to Applicant's, "Submission of Formal Drawings" filed January 6, 2004, in which FIG. 5 also is correctly labeled as FIG. 5. In view of the foregoing remarks, the Office is respectfully requested to reconsider and withdraw the objection.

The Office has rejected claims 2, 4, 6-7, 10, 13, 56-60, 62, 65-68, 70, 73-75, 85, 88-91, 93 under 35 U.S.C. 112, 2<sup>nd</sup> paragraph and claims 56-60, 62, and 65-68 under 35 U.S.C. 112, 1<sup>st</sup> paragraph. More specifically, the Office asserts in claims 4, 13, 87, 93, the subject matter claimed in these dependent claims is inconsistent with the subject matter in the independent claims from which these claims depend. Additionally, the Office asserts claims 56-60, 62, and 65-68 claim time scaling is applied to the doublet, but according to the disclosure of the invention, the time scaling is applied to one of the pair of substantially matched base signals (Fig. 2 and 5). Further, the Office also asserts claim 92 recites the limitation "the imaging information" in lines 7-8 lacks antecedent basis.

Applicant has amended claims 4, 13, 87, and 93 to be rewritten in independent form and has amended claim 92 to correct the antecedent basis issue. With respect to the Office's rejection of claims 56-60, 62, and 65-68 under 35 U.S.C. 112, 1<sup>st</sup> and 2<sup>nd</sup> paragraphs, Applicant respectfully traverses the Office's rejection. Contrary to the Office's assertions there clearly is recited support for the subject matter in claims 56-60, 62, and 65-68 throughout the above-identified patent application. By way of example only, support for these claims can be found at page 6, line 30 to page 7, line 2; page 7, lines 8-10, 16-18, and 24-25; page 8, lines 12-18 in the above-identified patent application. Applicant notes that the fact that there also are other disclosed embodiments simply has no bearing on whether there

is support for this claimed subject matter. Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw these rejections.

The Office has rejected claims 1-3, 5-6, 8-9, 15-16, 19, 65, 68-73, 77, 79-80, 84, 92, 95, 99-100, 103-109, 111, and 113, 115, 117-124, 126, and 128 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,178,317 to Kroeger et al (Kroeger), Claims 7, 17, 60, 67, 74, 76, 81, and 96 under 35 U.S.C. 103(a) as being unpatentable over Kroeger in view of what the Office asserts is instant application's disclosed prior art, claims 14, 57, 62, 78, and under 35 U.S.C. 103(a) as being unpatentable over Krueger et al, and further in view of US Patent Publication No. 2004/0260415 to Weiss (Weiss).

Kroeger, Weiss, and what the Office asserts is instant application's disclosed prior art, alone or in combination, do not disclose or suggest, "a transmission system with a time scale and time delay encoding system which applies one of a plurality of time scales and one of a plurality of time delays to one of a pair of matching base signals" as recited in claims 1 and 4, "applying one of a plurality of time scales and one of a plurality of time delays to one of a pair of matching base signals" as recited in claims 12 and 13, "a processing system which extracts the information from the doublet based on one of a plurality of time scales which was applied to the doublet prior to transmission; wherein the receiver further comprises a device that time scales a received signal from the doublet by the time scale that was applied to form a time scaled version of the received signal, a correlator that correlates the received signal with the time scaled version of the received signal to form a time delay correlation signal" as recited in claim 56, "a processing system which extracts the information from the doublet based on one of a plurality of time scales which was applied to the doublet prior to transmission; wherein the receiver receives a plurality of the doublets in a composite signal and the processing system extracts the information from the composite signal based on the one of the plurality of time scales which was applied to each of the doublets" as recited in claim 57, "a processing system which extracts the information from the doublet based on one of a plurality of time scales which was applied to the doublet prior to transmission . . . a time scaling device which applies at least one of the plurality of time scales to each of the received segments to form time scaled signal segments . . . a multiplier which multiplies each of the time scaled signal segments with each of the time delayed signal segments to form multiplied signals . . . an integrator which integrates the multiplied signals across time to form detection signals, the processing system comparing the detection signals

at different ones of the plurality of time scales and different ones of the plurality of time delays over time to determine the applied one of the plurality of time scales and the applied one of the plurality of time delays to extract the information from the detection signal” as recited in claim 59, “a processing system which extracts the information from the doublet based on one of a plurality of time scales which was applied to the doublet prior to transmission” as recited in claim 60, “extracting information from the composite signal based on one of a plurality of time scales which was applied to each of the doublets” as recited in claim 62, “extracting information from the composite signal based on one of a plurality of time scales which was applied to each of the doublets” as recited in claim 65, “extracting information from the doublet based on one of a plurality of time scales which was applied to the doublet” as recited in claim 67, “extracting information from one of the pair of matching base signals in the doublet based on one of a plurality of time scales which was applied to the doublet” as recited in claim 68, “a transmission system with a time scale and time delay encoding system embeds communication information by applying one of a plurality of time scales and one of a plurality of time delays to one of a pair of matching base signals, combines the time scaled and time delayed base signal with the other one of the pair of base signals to form a doublet, and transmits the doublet” as recited in claim 69, “applying one of a plurality of time scales and one of a plurality of time delays to one of a pair of matching base signals to embed communication information” as recited in claim 77, “a transmission system with a time scale and time delay encoding system which applies one of a plurality of time scales and one of a plurality of time delays to one of a pair of matching base signals, combines the time scaled and time delayed base signal with the other one of the pair of base signals to form a doublet, and transmits the doublet into an environment which embeds imaging information in the doublet” as recited in claim 84 and 87, or “applying one of a plurality of time scales and one of a plurality of time delays to one of a pair of matching base signals . . . combining the time scaled and time delayed base signal with the other one of the pair of base signals to form a doublet” as recited in claims 92 and 93.

The Office’s attention is respectfully directed to col. 3, lines 61 to col. 4, line 6, and col. 8, line 60 to col. 9, line 5, in Kroeger which clearly discloses that the first and second carrier signals 162 and 166 are not matching. Instead, these carrier signals 162 and 166 intentionally are at different base frequencies in case of a temporary fade or blockage impacting the first carrier frequency. In sharp contrast, in the present invention the base

signals are and need to be matching. The Office's attention is respectfully directed to page 9, lines 12, 28 in the above-identified patent application which states:

The underlying robustness of the present invention is primarily due to the structure of the doublet. The applied differential time-scale (compression or dilation) will be close to unity (unity time-scaling implies no compression or dilation) and the applied time-delay offset will be small relative to the length of the signal. Thus, each component of the doublet has approximately the same frequency content and the same signal structure at a given time. Since the two components are substantially identical, the channel, environment, transducers, nonlinear electronics, relative motion, etc., all affect both components substantially identically as well. Thus, even though the received signal may not resemble the transmitted signal at all, the two components of the doublet will closely resemble each other; they will be highly correlated. The differential offset between two components of the doublet will be easily detectable and can be accurately and precisely estimated. Therefore, information embedded in the offset can be robustly extracted despite serious received signal degradations. A matched filter receiver would perform poorly, but this new time-scale/time-delay offset modem will achieve almost all of the high time-bandwidth product gain associated with the base signal. (Emphasis added)

Additionally, contrary to the Office's assertions the modulator 164 along with the second carrier signal 166 disclosed in Kroeger do not teach or suggest time scaling. The modulator 164 is employing a SHIFTING operation on the frequency spectrum, not a SCALING operation. The Office's attention is respectfully directed to FIGS. 2A-2D in Kroeger which illustrate the frequency SHIFTING operation which has taken place on the first and second carrier signals 162 and resulting in the primary and redundant audio signals 210 and 220. However, there is no discussion or illustration of any TIME SCALING on these signals in Kroeger. Similarly, Weiss, and what the Office asserts is instant application's disclosed prior art also do not disclose or suggest the claimed matching base signals or time scaling.

Accordingly, in view of the foregoing remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 1, 4, 12, 13, 56, 57, 59, 60, 62, 65-69, 77, 84, 87, 92, and 93. Since claims 2-3, 511 depend from and contain the limitations of claim 1, claims 14-21 depend from and contain the limitations of claim 12, claim 58 depends from and contains the limitations of claim 56, claims 70-76 depend from and contain the limitations of claim 69, claims 78-83 depend from and contain the limitations of claim 77, claims 85-86 and 88-91 depend from and contain the limitations of claim 84, and claims 94-98 depend from and contain the limitations of claim 92, they are distinguishable over the

cited references and patentable in the same manner as claims 1, 4, 12, 13, 56, 57, 59, 60, 62, 65-69, 77, 84, 87, 92, and 93.

In view of all of the foregoing, Applicant submits that this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,

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/Gunnar G. Leinberg/  
Gunnar G. Leinberg  
Registration No. 35,584

NIXON PEABODY LLP  
Clinton Square, P.O. Box 31051  
Rochester, New York 14603-1051  
Telephone: (585) 263-1014  
Facsimile: (585) 263-1600